

# Adaptation of the Enterprises of the Real Economy Sector to Supply Chain Management and Digitalization in the Conditions of the Development of Virtual Relations

Vladimir F. Ukolov<sup>\*1</sup>, Vitaly V. Cherkasov<sup>2</sup>, Anna A. Ostrovskaya<sup>3</sup>

<sup>1</sup> *Management of a Digital Enterprise in the Fuel and Energy Complex of the Peoples' Friendship, University of Russia*

<sup>2</sup> *Department of Corporate Governance, Russian Academy of National Economy and Public Administration under the President of the Russian Federation*

<sup>3</sup> *Sector Management Center Industry Economic of the Peoples' Friendship, University of Russia*

**Abstract-** The article studies the insufficiently studied problem of adaptation of enterprises in the real sector of the economy to digitalization, in the conditions of active development of virtual relations. The author has set a goal - analyzing various aspects of this problem, to identify theoretical, practical features, the fundamental basis for the adaptation of enterprises in the real sector of the economy to digitalization and to develop a system of measures for its improvement. The aim of the research is the development and realization into practice of the basic theoretical principles and fundamental bases for the adaptation of enterprises in the real sector of the economy to supply chain strategy and digitalization, allowing them to become adaptive and more efficient. An analysis of a number of scientific primary sources devoted to the problem of adaptation allowed to the author not only to identify the essential foundations and features of the adaptation of enterprises in the real sector of the economy to digitalization, but also to establish its systemic nature of the simultaneous impact on all spheres of enterprises, their internal and external environment, which allows to develop a more balanced system of measures to improve it. The research used the methods of situational, structural and dynamic analysis, which provided an opportunity to study the adaptation of enterprises in the real sector of the economy to the conditions of supply chain strategy and digitalization, to trace its changes in time, in space and in close relationship with other phenomena. In assessing the state of adaptation of digital enterprises, a systematic approach was used. The exploration allowed to obtain scientific and practical results and conclusions, to identify the systemic nature of the impact of adaptation on all sides of the vital activity of enterprises in the real sector of the economy, on their internal and external environment of functioning,

significant about the need to increase the role and responsibility of managers for the promotion of new managerial practices of adapting to digitalization and obtaining the expected results of the effectiveness of transformations. The practical significance of the research's materials. Theoretical, practical features and the fundamentals of adaptation are used in practice, in the transition of enterprises in the real sector of the economy to digitalization. Their use contributes to the consolidation of the team into a single team, preserving the integrity of the enterprises of the real sector of the economy, increasing flexibility, sustainability, investment attractiveness, competitiveness and operating efficiency.

**Keywords-** globalization, supply chain management, adaptation, adaptability, digitalization, digital enterprise management, adaptive management, flexibility, sustainability, integrity.

## 1. Introduction

The urgency of the problem is determined by the fact that enterprises in the real sector of the economy have begun to move to work in the new conditions of digitalization that are associated with globalization. Digital technologies are becoming a solid foundation for all new technological solutions [1]. It is necessary to adapt to the conditions of digitalization, acquiring flexibility and sustainability, while preserving the integrity, culture of life philosophy within the framework of the value orientations of the functioning of the state. However, this is difficult to do, since adaptation to digitalization is carried out in conditions that are not typical for enterprises, industries, and state institutions, which are significantly different from previous reforms, including industrial revolutions. In addition, digitalization, as an instrument of

globalization, has significantly expanded the boundaries of competitive ability of business entities, within which most of them are not ready for civilized rivalry. Now, as R. Baldwin correctly notes [2], the competitive ability of products of enterprises in the real sector of the economy is largely determined not by state borders, but by the breadth of coverage of interaction relations and the degree of penetration of global production networks. According to the Global Center for Digital Business Transformation, in the next five years, the digital revolution will oust 40% of companies currently leading in the raw sector of the economy from the market if they are not subjected to digital transformation [3].

The possibilities of total supply chain strategy are based primarily on the development of the Internet, which is expanding more and more, providing the technological basis for digitizing information from enterprises in the real sector of the economy. The share of the digital Internet economy is growing in all developed countries. According to the data obtained by Gartner by 2025, digital transformation will affect all areas of the vast majority of countries in the world community [4]. Thus, the relations caused by globalization affect not only product manufacturers, but consumers and suppliers; runs ten times faster; applies to all aspects of the living activity of enterprises; directly affects the people working in them, the technology and production traditions.

The development of basic theoretical positions and the fundamental bases for the adaptation of enterprises in the real sector of the economy to digitalization, contributing to effective work in conditions of the global rivalry, is actual problem that has an important value for improving competitiveness, business, society and the state.

## 2. Literature review

The particular attention is focused on the problem under consideration in foreign and domestic literature. At the same time, adaptation to the conditions of digitalization, many authors study mainly from the point of view of adapting to the introduction and use of digital technologies. Attention is also paid to the consideration of other issues indirectly related to adaptation through digitalization, virtual space and virtual reality. Adaptation to digitalization is connected with the virtual space and touches upon the questions of psychology of staff communication. For example,

[5] considered the psychology of communication in the virtual space, which, as the study shows, manifests itself in the process of adaptation to digitalization, requiring appropriate consideration. In the works performed by Italian and Spanish experts [6, 7], an attempt has been made to develop a virtual environment conducive to the formation of a person's specific emotions, not excluding apparently the emotions associated with adaptation to digitalization.

The systemic nature of adaptation, the consideration of this phenomenon as a whole, taking into account the preservation of culture, the acquisition of flexibility and providing of the sustainability of corporate development, government regulation, and psychological management, have received virtually no attention. As a number of scientists note, investigating the problem of strategy of adaptation of US companies, digitalization has become a significant driving force and one of the drivers of modern business, but the rapid systemic changes have become more dramatic [8].

## 3. Materials and methods

Situational, structural and dynamic analysis was the leading method, which allowed studying the adaptation of enterprises of the real sector of the economy to digitalization, changes in time, space, in close connection with other phenomena. In assessing of the state of digitalization in enterprises of the real sector of the economy, a systematic approach was applied.

## 4. Results

(Checked for uniqueness) the systemic nature of the impact of adaptation on all spheres of life of an enterprise in the real sector of the economy, on its internal and external environment of existence is revealed. It has been established that culture, life philosophy and value orientations of personnel, personality psychology, socialization and motivation of personnel, communication, information system, organizational structure of management, used technologies, production and distribution, business processes and management are affected.

The importance of the adaptation of the enterprise and the complexity of the digitalization process, significantly change the requirements for the executive level of the organization, make it necessary to look for innovative solutions that are protected from unusual risks and actively promote

the promotion of new management practices of this process. Special theoretical and practical training of top management personnel is needed, which will allow to it to cope with the tasks of the conductor of digital transformation [9]. The completed study suggests that the criteria for assessing of changes, technology and management practices that are adequate to the specifics and difficulties of this phenomenon should be used to form strategic plans for adapting of an enterprise to digitalization. Preexisting research has made it possible to make conclusion that on a global scale the adaptation to the digitalization of enterprises in the real sector of the economy is aimed at connecting them to the global network economy. At the same time, an important function of adaptation is the orientation of enterprises towards ensuring the reproduction process, one of the essential conditions for the successful flow of which is the participation of adequate capital in it. In this regard, adaptation to digitalization should take place with the direct participation of the state. D. Tredwell, acting as director of large-scale practices of the work of digital platforms and rendering appropriate services, claims that governments interested in digitalization should first of all have such tasks as investing in the development of the Internet, science and research, in creating a modern regulatory framework [10]. Digitalization should also be tightly controlled by the state in terms of regulating of the processes of interaction of large, medium and small capitals. Control should be aimed at minimizing the risks of suppression of medium and small businesses, providing a variety of forms of development of national economies, by a large-scale capital. In addition, the state must develop a national strategy of cybersecurity. The damage from cyber-attacks carried out with the help of computer viruses is more than one billion dollars. Only in 2016 in the digital sphere of the entire world community, about 600 million crimes were committed. Losses at the same time reached \$ 400 billion. In accordance with Microsoft information, the number of cybercrime in the world has quadrupled in 2017 [11]. A comprehensive approach to solving the problems of digitalization of enterprises in the real sector of the economy requires the adaptation of state authorities themselves to the changing conditions of market relations, based on digitalization.

## 5. Discussion

In accordance with the data of studies conducted by McKinsey, by 2025 the digitization of the economy will increase GDP of Russia from 19 to 34% [12]. The transition to digital technologies will entail significant changes in all spheres of society and affect the enterprises of the real sector of the economy, determining the need to adapt people, their culture, communication, relationships, production, business processes and management. To successfully adapt enterprises to digitalization, it is necessary to recognize its nature, philosophical foundations. Then, in the course of adaptation, it will be possible to reach a new level of systemic nature, ensuring the interconnection of all functional divisions of the company among themselves and with the external environment [13].

Adaptation is a systemic phenomenon that affects not only the internal life of companies and corporations in the real sector of the economy, but also its external environment, including the population, which cannot stand aside, as a participant in this process. It is not by chance that in the program “Digital Economy” it is planned that by the end of its implementation, 40% of Russian citizens should acquire digital skills [14].

Digitalization, by measure of its development and spread of the digital economy, has a greater influence on the construction of modern society and is becoming the key mechanism of globalization [15]. The McKinsey Global Institute determined that the expected effect of the digitalization of the economy of the Russian Federation by 2025 could be from 4.1 to 8.9 trillion of rubles, or 19–34% of the total increase in the country's GDP. [16]. Moreover, the speed and processability of the ongoing changes caused by the digitalization of reality, is increasing every year. The Google Technical Director and renowned technology futurologist Ray Kurzweil forecasts that in the next 100th anniversary a scientific and technological breakthrough will be made that would take 5,000 years at the speed of change in 2016 [17].

Research into the issues of adaptation to digitalization in space shows that the world around us is increasingly seeks for non-linearity [18], becoming a serious test for preserving a culture of life activity and business activity, habitual integrity and flexibility. This is the most important global trend, to which digital enterprises, companies and corporations, the population and the state should be adapted, effectively responding to changes.

The modern space in which enterprises of the real sector of the economy work is very mobile and extremely unstable. The processes of transformation of old institutions, the emergence of new ones are constantly taking place in it, the number of laws, rules, relations, including changes in the interaction of the real and digital sectors of the economy, is expanding. The common, unified space in which these changes occur is represented by the external and internal components in relation to the enterprise. Changes in the external space for him are primary in relation to the changes occurring in the enterprise itself. As a result, the company is forced to constantly adapt, systematically fitting to change.

In the process of adaptation of enterprises in the real sector of the economy to digitalization, the consideration of the semantic space (meta-space), which determines the direction of adaptation, is important. It is a logical - semantic environment, which has a matrix basis, setting the mode of functioning of objects and business entities, in which connections and relations characteristic of a specific territory are formed. Metaspaces resist to the penetration of value attitudes that are alien for representatives of specific cultures, leveling of differences in national cultures, a false view of the way of life and organization of methods of management in adaptable enterprises. In this regard, the recognition of territorial metospaces and the consideration of its components in the formation of the strategy and mechanisms for its implementation must precede the adaptation of enterprises.

It is well to bear in mind that full adaptation of enterprises in the real sector of the economy is impossible without a developed information and educational infrastructure, which creates advantages in providing them by communicative, cognitive and creative capabilities. Modern communications should ensure the free flow of information and the proper level of efficiency of information exchange. Cognitive capabilities are designed to create the conditions for high-speed processing of large streams of digital data, new knowledge about the behavior of entrepreneurial entities and changes in the object-enterprise itself in real time. They should also give a clear idea of the potential technological resources that are available, ensuring the implementation of ideas into real and virtual reality. Creative, constructive opportunities are focused on the implementation of the set targets to transform the knowledge gained into an effective system of actions that contribute to the growth of capitals.

Thus, the development of information and educational infrastructure of enterprises in the real sector of the economy is a reliable guarantee for successful adaptation to digitalization, building in perspective of an effective model of interaction between the real and virtual sectors of the economy. One of the attractive aspects of digitalization is the entry of enterprises into the global economic system. The meaning of such entry can be justified if the enterprises of the real sector of the economy can attract capital flows, while providing opportunities for growth of its profitability and growth. The development of a system of effective interaction of intellectual, financial, natural and industrial capital is also significant.

In order for this to become possible and the digitalization has brought the expected benefits, it is necessary to create the appropriate infrastructure conditions, in particular, high-tech infrastructure. With its help, the effect of advancing of competing enterprises on foreign markets, which is expressed in the rate of capital turnaround and the benefits arising from this, is achieved.

Thus, full-fledged adaptation of business entities is possible when the appropriate infrastructure is created for its implementation and the high-tech infrastructure is not an exception to the rules, but an urgent need.

The success of the digital enterprises of the real sector of the economy is also largely determined by the depth of the new knowledge of adaptation and the skill of their use in practice. The higher it is the adaptability of organizations, the better it is the fecundity and work. However, not every adaptation is beneficial to society and the state. It can have both positive and destructive character. In order to avoid serious negative consequences of adaptation of enterprises in the real sector of the economy, we will consider other major issues of its promotion.

Each enterprise, depending on priorities, has its own range of tasks and its own approaches to adaptation, but there are system-forming, basic provisions common to all, having the fundamental importance, without which it is difficult to manage when trying to get a positive effect from adaptation.

Adaptation of the enterprise of the real sector of the economy to the conditions of digitalization plays the role of a peculiar filter, passing through which it changes in accordance with the current legislation. It improves the enterprise before it's entering into new space-time dimension and organizational and technological state.

Adaptation of enterprises to the conditions of digitalization is a special form of reflection of the current management system, the effects of external and internal environment, seeking to establish a stable, dynamic balance between them. It enables the enterprise to survive and realize certain targets in a more rational way, while protecting the living environment.

Researches show that the adaptation of enterprises to digitalization should be based on the diversity of cultures of a multinational people. Exactly the diversity of cultures predetermines the diversity of forms of adaptation. Scientists identify several hundred national and regional cultures of the modern globalizing world [19]. On their basis, various forms of adaptation of enterprises in the real sector of the economy to digitalization may appear. Precisely on the basis of culture it is necessary to build multivariate mechanisms for adapting to the digitalization of enterprises in the real sector of the economy, giving different possibilities to respond to changes. It contains special behavioral models that are transmitted to personnel in the process of socialization, the use of which allows them to adapt to external and internal changes in the most rational way. The interaction of cultures in the process of adaptation in the conditions of digitalization occurs not only within one country. Adaptation contains new knowledge, the process of obtaining which is also multinational. Its creation and implementation in the context of globalization are increasingly losing an exclusively national, intra-industry nature. The development of information and communication technologies allows to scientists, located in different parts of the world, to integrate their intellectual, financial and material resources, based on the diversity of cultures and the values contained in them, into a single intellectual system, the source of innovative knowledge in which are interacting cultures [20]. Adaptation contributes to the preservation of the enterprise of the real sector of the economy, which is under the influence of a constantly changing environment. At the same time, it is transformed under the influence of the cultural environment on the basis of feedback, within the framework of the changes taking place within the culture itself, which has ceased to satisfy the demands of society, for various reasons. If digitalization suits enterprises in the real sector of the economy, and its cultural, institutional, technical and technological, behavioral, and other models tested by practice for a long time do not destroy the human environment, then it is fixed as a

cultural tradition. So, adaptation to digitalization, if properly used, is a driver for both innovative and cultural changes of enterprises, as well as changes in the cultivation of their habitat. It is aimed at active protection of the most stable, key properties of the enterprise, its personnel and the entire transforming change management system and the environment of their functioning. It requires management of the process of adaptation of enterprises in the real sector of the economy, in the form of a targeted impact on the factors that predetermine its course, terms, reduction of possible adverse effects. The need for adaptation management is due to the likelihood of damage to enterprises, branches of the real sector of the economy, as well as the desire to improve the quality of their functioning. The process control of adaptation involves the interaction of all the special services that realize its behavior and should be locked directly on the first head of the organization. They can be independent divisions, or included in other structures of the enterprise. In general, the content of adaptation programs used by enterprises is very diverse and depends on their mission of an organizational structure, development plans and competitiveness. At the same time, the correct choice of strategy and adaptation mechanisms for enterprises in the real sector of the economy is important. The peculiarity of a set of such mechanisms sets the subject of adaptation. They may be: update of the mission of the enterprise; creating of a program of adaptation to digitalization; changing the corporate culture of a digital enterprise, within the framework of accepted values; planning of internal changes taking into account the forecast changes in the external environment; use of psychological management. These mechanisms are then effective when the control system using them has the properties of adaptability — the ability to respond quickly and flexibly to changes in the environment, make adequate decisions and minimize the negative effects of internal and external influences. Adaptive management allows to achieve the buildup of competitive advantages and sustainability [21], provides additional opportunities for survival and development. The adaptability of an enterprise in the real sector of the economy, including its management system, should be evaluated by its ability to transform itself in the digitalization process, preserving value orientations, sustainability, competitiveness and efficiency gains. It is the higher than the earlier the signs of various changes are noticed and more objectively evaluated. Adaptability depends on the real and virtual

capabilities of the personnel of the enterprise, its external environment, the whole adaptive potential to react to changes. Adaptive potential, the quality level of its state and use largely determine the speed of adaptation and the degree of adaptation of the enterprise. In relation to the adaptive potential of the enterprise, it is necessary to clearly understand what specifically needs to be changed in its work in order to maintain stability, how to transform management, so that it corresponds to the changed requirements for the object of management and personnel. Managers should be trained to make non-standard decisions in constantly changing conditions, not depend on the prevailing management stereotypes only on the basis of intuition, but reinforce it by the skillful use of conclusions derived from analyzing large data about the controlled object. They need to learn how to perform tasks such as the identification of global trends, including supporting their threats, identify new opportunities, and instantly adapt to change [22]. Two major factors affecting its functioning and development: competition and government regulation can help to sequencing of the process of adaptation of an enterprise in the real sector of the economy. At the same time, there is a clear relationship between them - the lower the level of competition, the more government regulation is required, and the higher the government regulation, the less space there is of free competition. However, this does not mean the need to give unlimited freedom of competition. The role of the state in the adaptation of enterprises in the real sector of the economy is very significant and it must be implemented in practice for various reasons, in particular, due to the imperfection of market mechanisms and the lack of a full foresight about the prospects for environmental changes, to which need to be adapted. In general, the state can either facilitate to the transition of enterprises in the real sector of the economy to work in digitalization conditions, or not contribute to it. The choice of a scenario for regulating these processes is not indifferent to enterprises and varies depending on the will of the state. In this period of time, the state in every possible way contributes to digitalization, but it still has all the levers of influence on this issue in one direction or another and, if necessary, can be used, depending on the emerging results. The state can realize its interests in this direction through economic and industrial policy. Successful adaptation of enterprises to digitalization can be facilitated by the economic policy of the state, aimed at changing the structure of the economy [23], as

well as the industrial policy resulting from it [24], aimed at creating of general conditions for improving competitiveness and economic growth of enterprises in the real economy [25]. At the same time, the activity of the state that influences the work of markets in the interests of the national economy is very important [26, 27].

Thus, the high adaptability of enterprises in the real sector of the economy, which is based on the interests of business, society and government, can only be achieved by creating conditions for this on the part of the state. The main conditions are: the formation of a national strategy for adapting to digitalization; adoption of the main regulatory documents governing the processes of adaptation to digitalization; the creation of various training programs for the actively working population and society as a whole to the constantly changing conditions of life activity.

In the context of regulation, the state should also determine the admissibility of the use of certain forms and methods of adaptation of enterprises of the real sector of the economy to the conditions of digitalization. It is one thing, the adaptation of enterprises to Russian standards, and another - to European or international. The choice remains with the state, on the basis of a multilateral analysis of this problem and the criteria used by it. Enterprises realize this choice, achieving possible efficiency in the real and virtual sphere of their activity.

## 6. Conclusion

The transition to supply chain strategy and digitalization of enterprises in the real sector of the economy is accompanied by fundamentally new, qualitative changes, carrying with it a complex of attractive opportunities and unexplored problems of various contents and levels of complexity. This necessitates a comprehensive, systematic approach to adaptation, affecting not only the internal life of the enterprise in the real sector of the economy, but also the external environment, including the population, institutions of state and interstate regulation, the relationship of business and government.

## 7. Conflict of interests

The author confirms that the submitted materials do not contain a conflict of interest.

## 8. Acknowledgments

The work was prepared with the support of the of the Peoples' Friendship University of Russia.

## 9. Gratitude

The study was carried out on the basis of work with grant of the RFBR No. 19-010-00040 "Interaction between the real and virtual sectors of the economy in order to increase their efficiency and ensure a balance of interests between business, society and the state". The authors are grateful to the Peoples' Friendship University of Russia for providing the conditions for conducting this study.

## 10. acknowledgements

The work was carried out on the research of the Financial University, carried out in the framework of the University-wide complex topic "The new paradigm of social development in the digital economy."

## References

- [1] Romanova O. A. Priorities of Russia's industrial policy in the context of the challenges of the fourth industrial revolution. Part 1 // *Economy of the region*. - 2018. - V. 14, no. 2. - p. 423.
- [2] Baldwin R.E. *The Great Convergence: Information Technology and the New Globalization*. — Cambridge, Massachusetts: The Belknap Press of Harvard University Press, 2016. — 344 p. — doi: 10.22363/2313-0660-2017-17-4- 866-873
- [3] Portal of choice of technologies and suppliers TAdviser. URL: <http://www.tadviser.ru/index.php/Компания>:
- [4] Gartner Inc. website URL: <https://www.gartner.com/technology/home.jsp> (access date: 12/27/2017)
- [5] Fogg B.J. *Persuasive technology: Using computers to change what we think and do*. Amsterdam, 2003.
- [6] Riva G., Mantovani F., Capideville C.S. et al. Affective interactions using virtual reality: The link between presence and emotions // *CyberPsychology and Behavior*. 2007. Vol. 10. N 1.
- [7] Banos R.M., Liano V., Botella C. et al. Changing induced moods via virtual reality // *Persuasive technology: Proceedings of First International conference on persuasive technology for human well4being* (May 2006, Eindhoven, The Netherlands) / Ed. by W. IJsselstein et al. // *Lecture Notes in Computer Science/ Vol. 3962*. Springer, 2006.
- [8] 8. Bauer V. P., Podvoisky G. L., Kotova N. E. Strategies for the Adaptation of US Companies to the Digitalization of Production Spheres. *World of new economy*. 2018; 12 (2): 78-89.
- [9] Shustikov V. Adaptation to digitalization. URL: <https://sk.ru/news/b/press/archive/2017/11/17/adaptaciya-k-cifrovizacii.aspx>.
- [10] Portal of choice of technology and suppliers TAdviser. Who\_and\_as\_controls\_developing\_the\_digital\_economics URL: <http://www.tadviser.ru/index.php>.
- [11] Solovyov O. RF promises to jump into the digital world // *Nezavisimaya Gazeta*. 10/18/2017. p. 2, 4.
- [12] Strelkova I.A. Digital economy: new opportunities and threats for the development of the world economy. *Economy, taxes, law*. №2, p. 22. 2018. URL: file: /// C: /Users/Olga/Downloads/tsifrovaya-ekonomika-novye-vozmozhnosti-i-ugrozy-dlya-razvitiya-mirovogo-hozyaystva.pdf
- [13] Kuntsman A.A. The specifics of the adaptation of modern companies to the conditions of the digital economy. File: /// C: /Users/Olga/Downloads/spetsifika-adaptatsii-sovremennyh-kompaniy-k-usloviyam-tsifrovoy-ekonomiki.pdf.
- [14] Shustikov V. Adaptation to digitalization. URL: <https://sk.ru/news/b/press/archive/2017/11/17/adaptaciya-k-cifrovizacii.aspx>.
- [15] Sergeev A. How digitalization captures all new industries. URL: <http://www.rbcplus.ru/news/59c01fb87a8aa942fef555de?ruid=uUjIA1vmj7EnocV3AxUOA g>.
- [16] Digital Russia. New reality. / McKinsey Report. 2017. July [Electronic resource]. URL: <https://www.mckinsey.com/~media/McKinsey/Locations/Europe%20>
- [17] Aiva. Ray Kurzweil painted the future of the world: forecast to 2099. [https://socialego.mediasole.ru/reyl\\_kurcveyl\\_raspisal\\_buduschee\\_mira\\_p](https://socialego.mediasole.ru/reyl_kurcveyl_raspisal_buduschee_mira_p)
- [18] Bloommart Tew, Stefan van den Broek. On the threshold of singularity: how will management change in the 21st century? <https://hbr-russia.ru/innovatsii/trendy/786061>
- [19] Novikov V.S., Perova A.E. Virtualization of the financial sector as a trend and adaptation to the current economic conditions of doing business. *Questions of economy*. 32 (122), p.49. 2012

- [20] Gnezdova Yu.V. The development of the digital economy of Russia as a factor in increasing global competitiveness // *Intellect. Innovation. Investments*. - 2017. - №5. - pp. 16–19.
- [21] Kukor E.L., Klimenkov G.V. Adaptive management of the industrial complex of the region: theory, methodology, practice. Monograph / under total. ed. B.L. Kukora. - Ekaterinburg-S.Peterburg: Institute of Economics, Ural Branch of the Russian Academy of Sciences, 2017. - 306 p. ISBN 978-5-94646-576-2. ISGZ No. 0404-2015-001.
- [22] Gitelman LD, Kozhevnikov M. V. A paradigm of management education for a technological breakthrough in the economy // *Economy of the region*. - 2018. - V. 14, no. 2. - p. 435.
- [23] Rodrik D. *Industrial Policy for the Twenty-First Century*. Harvard University, 2004. — 57 p.
- [24] Warwick K. *Beyond Industrial Policy: Emerging Issues and New Trends*. OECD Science, Technology and Industry Policy Papers No. 2. OECD Publishing. 2013 [Электронный ресурс] URL: <http://dx.doi.org/10.1787/5k4869clw0xp-en/> (дата обращения 23.03.2018 г.).
- [25] Beath J. *UK Industrial Policy: Old Tunes on New Instruments?* // *Oxford Review of Economic Policy*. — 2002. — Vol. 18. — No. 2. — P. 221–239.
- [26] Federico G., Foreman-Peck J. *European Industrial Policy: Introduction* // Foreman-Peck J., Federico G. (eds.) *European industrial policy: The twentieth-century experience*. N. Y.: Oxford University Press, 1999. — 484 Pp. — P. 1–17.
- [27] Vahid, Kheiry Mollaqaesem, Masood, Hafezi Ardakani , Saeed, Hesarakhi. *Bone Regeneration Using Nanotechnology – Calcium Silicate NanoComposites*, UCT Journal of Research in Science, Engineering and Technology, Issue 4,pp.01-03, 2013.